MODIS TECHNICAL TEAM MEETING

December 8, 1994

The MODIS Technical Team Meeting was chaired by Vince Salomonson. Present were Steve Ungar, Al Fleig, Bill Barnes, Wayne Esaias, Rosemary Vail, John Barker, Harry Montgomery, Ed Masuoka, Locke Stuart, David Herring, Yoram Kaufman, and Ken Anderson.

1.0 SCHEDULE OF EVENTS

Dec. 12	MODIS Quarterly Review at GSFC
Dec. 31	Revisions of ATBDs receiving a grade of C or D due to EOS Project Science Office
Jan. 15, 1995	Semi-annual reports due to Barbara Conboy
Jan. 24 - 25, 1995	MODIS Ocean Discipline Group Meeting, in Miami, FL
Jan. 26 - 27, 1995	Workshop on international Calibration/Validation Efforts for EOS Ocean Color Sensors, in Miami, FL
May 2, 1995	MODIS Calibration Working Group (tentative)
May 3 - 5, 1995	MODIS Science Team Meeting (tentative)

2.0 MINUTES OF THE MEETING

Salomonson said he is glad that MODIS Project is providing the funding to print the MODIS Brochure.

Barnes reminded the Team that the MODIS Quarterly Review is next week. Tom Pagano and Lee Tessmer, both of SBRC, will attend the meeting. There will be a 3-hour session on SBRC's testing of the Engineering Model (EM).

2.1 Ghosting Analysis Using MODIS Simulated Data

Fleig reported that over the last 2 months SDST has been developing simulated MODIS data sets, and has begun work on the camera model. Fleig stated that Dr. Qiu, of SDST, has been working closely with Gene Waluschka on ghosting analysis and they have now extended the implementation to include MODIS channels 27 - 36. Based on this model, it appears that in the visible channels, as a result of the "fixes" that will be implemented on the Protoflight and Flight Models, the ghosting problem is quite small. However, for the focal plane with channels 27 - 36 the model still indicates a significant ghosting problem. It is important to note that the computer model does not currently include the effect of tilting one of the filter planes which is currently being discussed. The model will incorporate this soon and we will then know what additional reduction in the ghosting this will produce. It is premature to reach any conclusion about the ghosting until this is done.

Fleig commented that in the current model, Qiu illuminated half of the focal plane for bands 27 through 36 and found that the half not illuminated still detected 3 to 5 percent of the signal. General discussion ensued. Barker cautioned the Team that these are not final, empirical results. He pointed out that the assumptions in Waluschka's model as implemented by Qiu are highly uncertain. He added that if the model proves to be an accurate reflection of MODIS' performance, then there may be software fixes which might be implemented. These software fixes do not currently exist and may be both theoretical, computationally intensive and controversial.

Barnes added that at this point in MODIS' development schedule, it is unlikely that anything substantive beyond what is currently underway can be done in the hardware to address the problem.

2.2 MODIS Project Reports

Anderson reported that assembly of the EM is almost complete. Masuoka asked if, once the EM is fully assembled, SBRC can test the ghosting problem to verify Chu's model. Barnes responded affirmatively.

2.3 SDST Reports

Masuoka reported that NASA Science Internet (NSI) has two T1 lines (each capable of carrying data at the rate of 1.5Mbits/sec) which run from GSFC to the Maryland Trade Center where the General Sciences Corporation (GSC) has contractors supporting the Data Assimilation Office. He stated that NSI will let the MODIS support contractors for SDST and MCST "piggyback" on the existing network to transmit data. Masuoka said NSI will increase the bandwidth of these network connections if they are too small to handle the traffic.

Barker said that he is ready to begin transmitting data as soon as he can get connectivity to the network.

2.3.1 Land Group Algorithm Meeting Rescheduled

Masuoka announced that the Land Team and SDST had planned to hold a joint meeting in Tucson; but it will be held at GSFC so that members of the SDST can attend and discuss issues that arise from the Level 2 and Level 3 Land algorithm integration with members of the Land Team.

2.3.2 MODIS Processing Allocation

Masuoka reported that EOSDIS has increased its allocation for processing MODIS products to 120 percent of the Team's requirement of 3.5 GFLOPS. HAIS, the EOSDIS contractor, expects this figure to roughly double each year for the first two years after launch, this capacity will be used for reprocessing.

Salomonson inquired about the what specific phasing scenarios for MODIS products have been provided to the EOSDIS/HAIS. Masuoka stated that SDST

has turned in MODIS software activation scenarios to the HAIS modeling team that require full processing capacity at launch. He said that if processing allocations are phased such that only products that have been thoroughly tested and validated are made, then it will be difficult to get the MFLOPS to integrate and test the full software suite in the first year after launch. If the TLCF were able to support all the integration and testing for the full product set and if it could handle data volumes large enough to check out the integrated software on a global basis, then the MODIS Team could might accept a phased approach for production after launch. Masuoka also stated that the activation scenario can be changed for any or all products via an email to emasuoka@ltpsun or a phone call.

Fleig stated that CERES has a different perspective on the EOSDIS processing allocations. CERES can produce guaranteed products at launch because they will produce an ERBE-like data set. With ERBE-like algorithms, they will process their data one month out of every three. Then, over time, they will add new algorithms. In short, CERES didn't like their EOSDIS allocation, but they devised this plan to work within it.

Salomonson feels that the EOSDIS allocations, although recently upgraded so as to handle present projected needs, they may still not be adequate based on the histories associated with projects such as UARS. Fleig added that it is clear that EOSDIS is doing its cost model for hardware for processing. However, he questions whether an equivalent level of work is going into the cost model for other things—e.g., the ability to search among data, extra features in the information management system, quality assurance, browsing capabilities, etc. Fleig pointed out that UARS' processing requirements increased by a factor of 100 from beta delivery to post launch. So, the historical concern is that there has always been substantial growth in processing requirements, from beta delivery to launch, and there is no reason to think it will be otherwise for EOS instruments.

Salomonson asked Masuoka and Fleig to forward their ideas and concerns on EOSDIS to him so that he can address them in an upcoming meeting.

2.3.3 Output Data Structures

Fleig reported that the CERES Team raised a question pertaining to arranging output data structures. They found that ERBE data users search for data in characteristically different ways. So, CERES proposes organizing data in different ways—e.g. by time, date, geographic location, etc. Fleig said we should begin thinking of how we want to output MODIS data; however, given processing constraints we can't output them many different ways. The issue is a tradeoff between storage volume and access time.

2.3.4 Gridding Concerns

According to Fleig, Michael King, EOS Senior Project Scientist, asked SDST to pre-aggregate the radiances for each MODIS Channel so that anyone wanting to

use the 250 m channels in conjunction with the 500 m and/or 1 km channels may do so. In short, King wants to ensure that the aggregation is done once so that users do not have to do their own aggregation separately.

2.3.5 Data Simulation Plan

Fleig reported that SDST is making progress in its Data Simulation Plan. He said the plan will focus only on test data sets for testing flow; SDST will not provide simulated MODIS data.

2.4 MAST Reports

Herring submitted the MODIS Science Team Meeting Minutes to Salomonson for final review.

3.0 ACTION ITEMS

3.1 New Action Items

1. *Masuoka and Fleig*: Forward your ideas and concerns on the EOSDIS to Salomonson so that he can address them in an upcoming meeting on Tuesday [Closed].

3.2 Action Items Carried Forward

2. *MODIS Team*: Determine how, given the MODIS bowtie effect, MODIS images will be produced at launch. [This may be a suitable topic for discussion at the next Science Team Meeting.]
3. *Fleig and Ungar*: Interact with the group leaders prior to developing a MODIS data simulation plan for review at the next Science Team Meeting. [Work on this item is still in progress.]
4. *Masuoka*: Develop a set of comments from MODIS on the third version of the Quality Assurance plan and forward to the Team Leader for review.